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## (54) PRINTING MECHANISM

(71) We, MASCHINENFABRIK AUGSBURG - NURNBERG AKTIEN-GESELLSCHAFT, a German company, of 1 Stadtbachstrasse, 8900 Augsburg, Germany, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to a reversible printing mechanism for a rotary offset lithographic machine, including a plate cylinder, a dampening system wherein dampening liquid is applied on the plate cylinder via two rollers, and an inking system comprising a plurality of forme rollers, distributor rollers, and intermediate rollers fed with ink from a fountain roller.

In a known reversible printing machine, change-over of the machine from the one to the other direction of rotation is inconvenient because not only must rollers be interchanged, but so must also the dampening liquid containers.

It is the object of the invention to simplify the changeover from one direction of rotation to the other, to make possible an enhancement of the quality of the printed product by employing an inking system having a plurality of distributor rollers and effecting ink distribution in both directions of rotation.

According to the present invention, there is provided a reversible printing mechanism for a rotary offset lithographic printing machine, including a plate cylinder, a dampening system wherein the dampening liquid is applied on the plate cylinder via two rollers, and an inking system comprising a plurality of forme rollers, distributor rollers, and intermediate rollers supplied with ink from a fountain roller, and wherein the two rollers serving for dampening in one direction of the rotation of the plate cylinder constitute, in the other direction of rotation of the plate cylinder, a part of the inking system and the rollers of a part of the

inking system are employed in the said other direction of rotation as dampening rollers, the arrangement of the rollers being such that three of the distributor rollers contact the forme rollers and are adapted to be connected by a pair of intermediate rollers, the positions of which are variable, with a further distributor roller fed with ink, whereby one of the three distributor rollers is connected, in both of its directions of rotation, with the further distributor roller by that roller of the pair of intermediate rollers which is first contacted by a point on the said one of the three distributor rollers after the latter has contacted the forme roller or rollers, whereas the two other rollers of the three distributor rollers are connected alternatively via the further roller of the pair intermediate of rollers, depending on the direction of the rotation of the plate cylinder with the said one distributor roller.

Due to this measure, it becomes possible, for example by simple pivoting of the supports of the pair of intermediate rollers about the axis of the said one of the three distributor rollers, to adapt the inking and dampening systems to the particular direction of rotation.

Preferably, the three distributor rollers which contact the forme rollers are arranged, as viewed in the axial direction, in a row, and the said one of the three distributor rollers is the central roller of the three.

In advantageous development, with this arrangement, two forme rollers are contacted by the said one of the three distributor rollers, whereby there is achieved a simpler and clearer construction which, due to the symmetrical bearing arrangement, also makes less expensive manufacture possible.

With the employment of so-called spray-type dampening units, furthermore, only little space is required so that two spray-type dampening units may be provided for

respectively spraying dampening liquid onto the said two other rollers of the three distributor rollers.

The invention may be carried into practice in a number of ways but one specific embodiment will now be described, by way of example only, with reference to the accompanying drawings, in which:

Figure 1 shows, in diagrammatic form, a printing mechanism with the roller arrangement for a plate cylinder rotating clockwise, and

Figure 2 shows the same printing mechanism with the rollers arranged for the case of a counter-clockwise rotating plate cylinder.

The printing mechanism shown comprises impression cylinder 1, a blanket cylinder 2 and the plate cylinder 3. The paper web 4 is, in the case of the clockwise direction of rotation of the plate cylinder 3 shown in Figure 1, guided from above downwardly (as indicated by the arrow) through the printing mechanism.

Associated with the plate cylinder 3 is a dampening system having a moisture applying roller 5 and a moisture distributor roller 6, the dampening liquid being applied by a spraying device 7 onto the moisture distributor roller 6.

The inking system comprises the three forme rollers 8, 9, 10 and two distributor rollers 11 and 12, distributor roller 11 bearing against the forme roller 8 and the two forme rollers 9 and 10 being contacted by the distributor roller 12; the ink is supplied to a further distributor roller 13, via a plurality of rollers 14, 15 from a fountain roller (not shown).

In order to be able to feed the ink from the distributor roller 13 to the distributor rollers 11 and 12, there is provided a pair of intermediate rollers 16, 17 one roller 16 of which connects the distributor roller 13 with the distributor roller 12 whereas the other intermediate roller 17 of the pair contacts the distributor roller 12 and the distributor roller 11. With the aid of the arrows shown, the flow of ink from the distributor roller 13 as far as the plate cylinder 3 can be understood.

If the direction of rotation of the plate cylinder 3 is to be reversed, i.e. if it becomes necessary to rotate it counter-clockwise, whereby the paper web 4 is guided from below upwardly through the printing mechanism, then it is merely necessary to pivot the pair of intermediate rollers 16, 17 about the axis of the distributor roller 12, in such manner that, whilst maintaining contact therewith, the roller 16 bears against what had hitherto been the moisture distributor roller 6 and the roller 17 bears against the distributor roller 13, the roller 17 being lifted-off from the distributor roller 11 and

the roller 16 from the distributor roller 13. The flow of ink from the distributor roller 13 then takes place (as will be gathered from Figure 2) via the roller 17 to the distributor roller 12 and from there via the roller 16 to the roller 6, formerly the moisture distributor roller, and the roller 5, formerly the moisture applying roller, or from the distributor roller 12 to the forme rollers 9 and 10. The rollers 11 and 8, formerly the distributor roller 11 and the forme roller 8, then constitute the dampening system, in combination with a further spraying device 7 which then requires to be brought into operation, instead of the spraying device 7, and which is provided additionally to the spraying device 7.

In order to be able to pivot the pair of intermediate rollers 16, 17 about the axis of the distributor roller 12, there are rotatably mounted on both bearing bushes of the distributor roller 12 bell crank levers 18 at the two ends of each of which the rollers 16 and 17 are respectively mounted. By means of a double-acting pneumatic adjusting piston 19, preferably at each bell crank lever 18, pivoting of the rollers 16, 17 out of the one and into the other position can be effected in simple manner.

As will be appreciated from Figures 1 and 2, for each direction of rotation of the plate cylinder 3, the distributor roller 12 is connected, in both of its corresponding directions of rotation, with the distributor roller 13 by that roller of the pair of intermediate rollers 16, 17 which is first contacted by a point on the distributor roller 12 after the latter has contacted the forme rollers 9 and 10.

#### WHAT WE CLAIM IS:—

1. A reversible printing mechanism for a rotary offset lithographic printing machine, including a plate cylinder, a dampening system wherein the dampening liquid is applied on the plate cylinder via two rollers, and an inking system comprising a plurality of forme rollers, distributor rollers, and intermediate rollers supplied with ink from a fountain roller, and wherein the two rollers serving for dampening in one direction of rotation of the plate cylinder constitute, in the other direction of rotation of the plate cylinder a part of the inking system, and the rollers of a part of the inking system are employed in the said other direction of rotation as dampening rollers, the arrangement of the rollers being such that three of the distributor rollers contact the forme rollers and are adapted to be connected, by a pair of the intermediate rollers, the positions of which are variable, with a further distributor roller fed with ink, whereby one of the three distributor rollers is connected, in both of its directions of rotation, with the further

distributor roller by that roller of the pair of intermediate rollers which is first contacted by a point on the said one of the three distributor rollers after the latter has  
5 contacted the forme roller or rollers, whereas the two other rollers of the three distributor rollers are connected alternatively via the further roller of the pair intermediate of rollers, depending on the  
10 direction of rotation of the plate cylinder with the said one distributor roller.

2. A reversible printing mechanism as claimed in claim 1, in which the three distributor rollers which contact the forme  
15 rollers are arranged, as viewed in the axial direction, in a row, and in which the said one of the three distributor rollers is the central roller of the three.

3. A reversible printing mechanism as claimed in claim 1 or claim 2, in which two  
20 forme rollers are contacted by the said one of the three distributor rollers.

4. A reversible printing mechanism as claimed in any one of claims 1 to 3, in which  
25 two spray-type dampening units are provided for respectively spraying dampen-

ing liquid onto the said two other rollers of the three distributor rollers.

5. A reversible printing mechanism as claimed in any one of claims 1 to 4, in which  
30 the pair of intermediate rollers is mounted for pivoting about the axis of the said one distributor roller on bell-crank levers adapted to be pivoted by pneumatically  
35 actuatable, double-acting adjusting pistons.

6. A reversible printing mechanism substantially as specifically described herein with reference to the accompanying drawings.

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